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THE GAMBIA

REPORT ON THE MEDICAL AND HEALTH SERVICES FOR THE YEAR, 1948.

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REPORT ON THE MEDICAL AND HEALTH SERVICES FOR THE YEAR 1948.

I. IMPORTANT EVENTS OF THE YEAR.

(*a*) *Colonial Development Corporation.* The Corporation commenced its programme with preparations for the institution of the large-scale poultry and egg project. This may be the forerunner of extensive agricultural ventures still under consideration, all of great potential importance to the health and economy of the country.

(*b*) *Human Nutrition Research Unit.* This subsidiary Unit of the Medical Research Council actively continued work in 1948 through the Research Station at Fajara, and the Field Working Party centred on Genieri in the Central Division. The work of the former, hitherto concentrated chiefly on various aspects of nutrition, is now intended to cover a much wider field, such as:—

(i) Research into eye diseases includes those wholly or partly due to malnutrition.

(ii) Gastro-intestinal diseases.

(iii) Infant feeding and the diseases of young children.

(iv) Anaemia.

(v) Skin diseases.

(vi) Extension of work on pathology of liver.

(vii) Parasitisation.

The Field Working Party, having successfully overcome various initial difficulties continue to make progress in the ambitious experiment of devising practicable methods of grafting mechanised agricultural production on to a peasant community. Fuller details of this important venture were given in the 1947 Report.

(*c*) *Medical and Health Units.* In the latter part of the year arrangements were completed to commence erection of the first phase of reconstruction of the new Victoria Hospital, Bathurst, details of which were given in the 1947 Report. Work is now actively proceeding.

Work also commenced on conversion of existing buildings at Brikama and Kuntaur into Health Centres, and preliminary arrangements were made to erect a new Health Centre at Mansakonko, now the Divisional Headquarters of the Central Division. Sukuta Clinic and staff quarters were also rebuilt.

As foreshadowed in the 1947 Report the ex-P.U.D. Headquarter premises were occupied during the year by the combined Medical and Health offices and stores, etc. to the great satisfaction of all concerned.

(*d*) *Swamp reclamation.* In December the approval of the Secretary of State was received to the recommendation that consulting engineers should be asked to advise on the practicability of the scheme to reclaim the extensive swamp lands in and adjoining the Island of St. Mary.

(*e*) *Airports.* There are indications that Yundum Airfield and Half-Die Seaplane base may regain a former importance, for civilian air traffic, and the health implications are again under review.

II. ADMINISTRATION.

(*a*) STAFF.

The following changes were recorded :—

The title of the head of the Department was changed from Assistant Director of Medical Services to Director of Medical Services in August.

Dr. C. W. F. Mackay, returned from leave on 1st April, having been relieved by Dr. T. P. Eddy, Medical Officer of Health, who in turn proceeded on leave on 21st August.

Drs. Horn and Gordon proceeded on leave on 11th July and 21st August respectively prior to transfer to Nigeria, and Dr. Hadden proceeded on leave on 11th December. Dr. Jones returned from study leave in United Kingdom on 20th August, and Dr. G. E. Porter, on transfer from Cyprus, assumed duty on 14th July. Dr. E. F. B. Forster returned from leave on 17th November.

The shortage of doctors due to the incidence of leaves and transfers severely limited the amount and supervision of the medical work undertaken. On the departure of Dr. Eddy and Mr. Campbell, Entomologist, on leave, the Director necessarily took over their duties in addition to his own.

Mr. J. G. Rees, Sanitary Superintendent assumed duty on first appointment on 17th January, and Mr. T. MacCarthy proceeded on leave on 3rd January, 1949 prior to termination of agreement.

The post of Senior Nursing Sister remained vacant throughout the year, and Mrs. Campbell Nursing Sister (née Wight) acted. Mrs. Kennedy, (née Dawson), Welfare Sister resigned on marriage and Mrs. F. A. Brough, M.B.E., assumed duty in a temporary capacity.

It is a pleasure to record that Mr. T. B. O. Fowlis, Sanitary Inspector-in-charge Mosquito Control, was awarded the British Empire Medal, 2nd Grade Dispenser Manga assumed duty as Storekeeper *vice* Mr. S. C. Tebbs who reverted to dispensing duties.

The Gambia Women War Workers nursing medal was won by Nurse Esther King, and the medal, and the various training certificates gained by other members of the Department, were presented to the recipients by the Governor at the annual award ceremony.

The intensive training programme for the needs of the expanding Department continued, and the Sanitary Inspector's curriculum was again revised to give further conformity with the Royal Sanitary Institute standards for West Africa.

B. LEGISLATION.

List of Ordinances, Regulations, etc. affecting Public Health during the year.

Serial No.	Date.	Short Title.	Provisions.
		ORDINANCES.	
3	22nd March 1948	The Births, Deaths, and Marriages Registration (Amendment) Ordinance 1948.	Amending the Principal Ordinance of 1886.
		REGULATIONS.	
1	6th January 1948	The Diseases of Animals (Prevention of Rinderpest) Regulations, 1948.	Prevention of rinderpest control measures.
3	16th February 1948	The Kombo St. Mary (Building) (Amendment) Regulations, 1948.	Amending Regulations No. 15 of 1947.
4	17th February 1948	The Hospital & Dispensaries Fees (Amendment) Regulations, 1948.	Amending Regulations No. 15 of 1947.
8	29th May 1948	The Aerated Water Factory Regulations, 1948.	Licensing and sanitary control of aerated water factories.
15	11th August 1948	The Colony Lands Regulations, 1948.	Licensing and sanitary control of timber cutting and quarrying
		ORDERS.	
5	2nd June 1948	The Dangerous Drugs Order, 1948.	Amending Part V of the Dangerous Drugs Ordinance, 1935.
		NOTIFICATIONS.	
1	29th January 1948	—	Establishment of markets at Bondali and Sambang.
13	25th November 1948	—	Establishment of Protectorate market (revised list).

C. FINANCE.

MEDICAL AND HEALTH SERVICES.

	Estimated.	Actual.
Revenue	£ 5,500 0 0	£ 5,358 0 0
Expenditure	75,801 0 0	69,526 0 0

Miscellaneous Services

	Estimated.	Actual.
Contribution to Medical Associations, Schools, etc.	£206	£160 0 0

Colony.

	Estimated.	Actual.
Total Revenue	£918,500	£732,154
Total Expenditure	917,810	999,873

Percentage expenditure on Medical and Health Services 6.95%.

(*d*) *Medical Supplies.* As in 1947 unusual difficulties were encountered. On the whole the supply position from the United Kingdom improved, but the move from the multiple premises hitherto utilised to the new amalgamated central store, and a simultaneous necessary change of Store-keeper, created much extra work. Various stock deficiencies again revealed by the demands of the expanding Department, called for a certain amount of rationing and improvisation measures which fortunately proved adequate. Approval was obtained to carry forward 1947 Departmental savings of £3,866 to 1949 votes, and this latitude together with the acquisition of greatly increased store accommodation, permitted the preparation of advance 1949 indents of a size calculated to ensure the holding of some nine months margin of main stocks for the immediate future. Policy is to increase this margin as funds permit to a level of approximately fifteen to eighteen months reserve stock.

III. PUBLIC HEALTH.

(*a*) HOSPITAL AND DISPENSARY STATISTICS.

Patients treated in the past three years are compared:—

	HOSPITALS.		HEALTH CENTRES AND DISPENSARIES.		
Year.	Total Attendances	Outpatient New Cases	Outpatient Attendances	New Cases	Admissions.
1946	2903	*	37,830	52,608	*
1947	3594	35,284	57,664	53,754	138,145
1948	3707	31,657†	59,208	47,823	115,874

(*b*) UNIT DISTRIBUTION.

Changes have been reported in Section I.

(*c*) GENERAL REMARKS.

Medical liability has steadily increased in post war years owing to the greater number of expatriate persons now employed in the Colony, and in 1948 the arrival of relatively large numbers of Colonial Development Corporation employees, often accompanied by wives and Children has added further burdens. The potentialities of this situation continues to cause disquiet in the Department in the force of continued difficulty in recruiting doctors, and unavoidable delay in providing additional Hospital accommodation.

European Health. (Approximate number resident: 300 Europeans and 300 Syrians). Perhaps the outstanding feature apart from the great increase in this section of the population was the change in the clinical picture of malarial attacks in non-immunes following greater use of paludrine The classical sequence of symptoms tend to be replaced by an indistinguishable form of malaise with or without pyrexia, and the acute attacks of ague, or the severer complications of the disease commonly noted in the past, are becoming rarer. In effect, malaria in non-immunes is now seldom recognisable without laboratory confirmation, but nevertheless the disease remains unduly prevalent in its modified form. It is clear that the original advertised dosage of the new drug is inadequate for non-immunes in this Colony whether for prophylaxis or cure, and that local strains of the subtertian parasite are only partially affected. In consequence much larger doses are exhibited for curative purposes, generally in association with quinine or mepacrine, and the most effective combination continues to be sought. For prophylaxis there is already a tendency to revert to quinine or mepacrine.

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* Separate totals are not available.

† While staff postings are often reflected in the yearly variations in numbers of patients treated, the increasing activity of the M.R.C and the work of Anglican Mission treatment units. (for which figures are not available) must be taken into account. In addition it was necessary to suspend service at two Sub-dispensaries for part of the year.

African Health. (Population approximately 248,000).

General diseases. As usual the uninformative " diseases of the digestive system " was the commonest condition treated, (13,965), followed this year by malaria (10,383) in which the great majority of diagnosis remained unconfirmed. The " Ill-defined " group is next (8,849) and the components often conjectural. Bronchitis, (8,826) is high and may also contain a considerable percentage of undiagnosed ailments. Of the remainder, diarrhoea and enteritis (3,391), helminths (5,549), and dysentery (434) continue to demonstrate primitive sanitation standards.

Communicable diseases. The following group is contrasted with last year's figures given in brackets:—

(i) Malaria 10,383 (7,000). It is not possible to make a useful inference from the increase. Prophylaxis, except in non-immunes, remains negligible, and the diagnosis in the Protectorate not always accurate.

(ii) Sleeping Sickness 1,568 (2,225). The gradual reduction noted over the past few years may well be an indication of the value of the increasing exhibition of antrypol in particular. Tsetse-control measures have not yet started.

(iii) Cerebro-spinal fever 47 (97). Here again a steady annual reduction has been noted over the past few years, due chiefly it is thought to earlier treatment since the knowledge of the efficacy of early sulphonamide therapy has become more wide-spread. On the other hand extensive epidemics have not occurred recently.

(iv) Dysenteries 434 (451).

(v) Tetanus 44 (37). Still prevalent in Bathurst and vicinity, presumably as a legacy of the horse era.

(vi) Smallpox 24 (25). An intensive campaign recommenced in the Protectorate resulted in some 17.357 vaccinations being performed there. The campaign continues.

(vii) Tuberculosis. Respiratory 246, other forms 24. (217.50). Meantime depressingly little can be done to ameliorate the high mortality.

(viii) Leprosy. No fresh useful statistics can be given as few seek the aid of the minimal facilities yet available.

(ix) Venereal diseases 3,386 (2,139). The increasing attraction of penicillin, and the routine examination and treatment at ante-natal clinics are thought to explain the greater numbers treated, but these figures are in no way an index of the actual prevalence.

(x) Yaws, 5,150 (5,792). It is too early to presume that increasing treatment facilities, without comparable progress in housing and sanitation, are seriously affecting the incidence.

(xi) Bronchities 8,826 (4,725). The considerable yearly variation in these figures may be taken as an indication of uncertain diagnosis and the group is used for coughs of all descriptions. More important is—

(xii) The pneumonias, 460 (652). As many are seen in outstations as outpatients only, the recorded Bathurst mortality of 41 deaths in 326 cases is the only reliable guide to the high mortality experienced.

(xiii) Whooping cough 207 (363). The decrease this year is regarded as fortuitious.

IV. VITAL STATISTICS.

No reliable Vital Statistics are obtainable outside Bathurst. Bathurst Statistics continue to show some defects, though there has been improvement in recent years.

It is believed that still-births are much more accurately recorded than formerly, fewer early infant-deaths being wrongly described as still-births; the great discrepancy in numbers of births notified to the Medical Officer of Health and births registered with the Colonial Registrar has been reduced, though not quite abolished.

In Bathurst 626 live-births were registered during the year and 628 live-births were notified to the Medical Officer of Health. 34 births were registered in the town, which had not been notified by midwives, making an estimated total of 662 live-births.

429 deaths were registered during the year. Of these, 67 were deaths in the hospital of non-Bathurst residents, of which 12 were under 1 year of age.

No accurate estimate of the population has been made since the 1944 census. The population is believed to have decreased since then, and therefore vital statistical rates based on 1944 census must be considered with reserve.

Bathurst.	Crude.	corrected (excluding deaths of non Bathurst residents).
Population (1944 census)	21,152	21,152
Live Births	662	662
Still Births	56	54
Deaths	429	362
Deaths under 1 year	98	86
Birth Rate, live births per 1,000 population	31	31
Death Rate, Deaths per 1,000 population	20	18
Infant Mortality Rate, Deaths under 1 year per 1,000 live births	148	130
Still Birth Rate, Still Births per 1,000 total births	78	78

Comparison with previous years:

Crude uncorrected rates.

	1946.	1947.	1948.
Population, 1944 census	21,152	21,152	21,152
Live Births	735	701	662
Still Births	88	80	56
Deaths	482	499	429
Deaths under 1 year	76	97	98
Birth Rate:— (Live births per 1,000 pop.)	35	34	31
Death Rate, (Deaths per 1,000 pop.) ...	23	23	20
Infant Mortality Rate (Deaths under 1 year per 1,000 live births)	103	138	148
Still Birth Rate (Still Birth per 1,000 total births)	107	102	78

This year, there is a reduction in both births and deaths. This undoubtedly is due to a reduction in population. The Infant-mortality rate has risen, but the still-birth rate has been more than proportionately reduced. This can be attributed to greater accuracy of registration of still-births (as noted in former reports, many infant deaths were registered as still births), but routine Kahn-testing and anti-syphilitic treatment in ante-natal clinics may have contributed to the result.

V. HYGIENE AND SANITATION.

(*a*) PREVENTIVE MEASURES.

The situation in relation to the more important diseases is as follows:—

(i) *Mosquito control.* The most important new measure is the major swamp reclamation proposals for the Colony, more fully described last year, and again referred to under Important Events in this Report. The Entomologist has prepared a further report on Protectorate Conditions*, in which, *inter alia,* valuable suggestions for mosquito control in some of the most important swamp areas of the Protectorate are given. These link-up closely with both agricultural economy, and general sanitation however and cannot be undertaken in isolation from them. For many reasons therefore it is not possible to visualise early application. Mr. Campbell has also worked out an interesting and economical method of mosquito control by alteration of the salinity of certain swamp areas subject to both fresh and salt water influences. Unfortunately, for this purpose, suitable areas are restricted in size and number. The severe rains of 1948 severely damaged the outfall works partly erected at the outlet of the Kotu stream, and contiol has in consequence been delayed. It is hoped to make control effective before the 1949 rains commence.

(ii) Yellow Fever. No cases recorded, and the Aedes index remained nil both in the Colony and in Yundum Airport and environment. A decision to discontinue mass immunisation in Bathurst has been postponed while Rockefeller vaccine stocks remain available, and pending a decision to manufacture the new type of scarification vaccine in West Africa.

(iii) Smallpox. Following procurement of increased supplies of vaccine, a fresh intensive campaign was commenced in the Protectorate and some 17,357 vaccinations were performed.

(iv) Sleeping Sickness. Dr. Nash's valuable preliminary tsetse survey has now been publishd, and the local situation thereby revealed was subsequently reviewed with the Director of the West African Research Unit. Tentative arrangements have been formulated with a view to commencing tsetse control measures as soon as practicable. Present hopes are that a start may be found possible late in 1949 or early in 1950.

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*Now printed.

(v) Venereal diseases. Proposals to tackle these prevalent diseases on a wider scale have been given much local consideration, but formidable general and special difficulties are recognised to exist which might offer serious difficulties to the successful prosecution of a mass campaign. Further it is appreciated that there is no known precedent for a measure of this kind in tropical Africa. The problem will be discussed again with the Venereologist of the visiting panel of United Kingdom specialists who is to visit West African territories in 1949.

(vi) Leprosy. Here again the problems are formidable, and the position is that while tentative plans have been made in conformity with the " Ross Survey " recommendations, it is recognised that little can be done without considerable external support, aided it may be, by further economical advances in treatment methods and costs. Meantime the advice of United Kingdom authorities is awaited. In the absence of adequate segregation facilities, or legal sanction for compulsory segregation, preventive measures other than treatment are impracticable.

(*b*) GENERAL MEASURES.

(i) Bathurst drainage. Unusually severe floods experienced during the year again demonstrated the urgent need of the major scheme now partly completed.

(ii) Bathurst conservancy. The programme substitute " static " tank public latrines for the present bucket disposal system makes slow but steady progress, and it is anticipated should be completed in 1950.

(iii) Protectorate conservancy. Improved public latrines are in course of installation at the important wharf towns of Kuntaur and Kaur. Apart from the general demerits of the bucket disposal system, the increased cost of these buckets is an added insentive to encourage the substitution of augur-dug bore-hole latrines in private compounds, and there are indications that Native Authorities are being induced to purchase sets for communal use in each area at a small charge to compound owners. Augurs are now in better supply and a modified but adequate equipment can be purchased for approximately £40.

(iv) Bathurst water supply. In December an application was made to the Secretary of State for a free grant of £10,000 to enable investigations to be made into the practicability of obtaining from deep bore-holes in the Kombo an ample supply of pure water for Bathurst and the villages in the neighbourhood. This application was based on the findings of Engineers of Messrs Howard Humphrey & Sons, contractors. The present waterwarks at Abuko were constructed to meet the needs of Bathurst when the population was some 10,000. The source of supply is therefore no longer adequate, and it is proposed to endeavour to allow for a daily consumption of 25—30 gallons per head in future, both for the increased population of Bathurst and nearby Kombo areas.

(*c*) School Hygiene. Owing to the absence of the Medical Officer of Health school inspection in Bathurst was in abeyance for the latter part of the year, except for "cleanliness" inspections undertaken by the Welfare Sister. With the appointment of a Government Dentist arrangements were made for future dental inspections. School inspection in the Protectorate continued however, and the reports indicate a slow but steady all-round improvement.

Following on the Departmental milk demonstration with school children described in last year's report, the Human Nutrition Research Unit has undertaken further work into the problems of supplementary feeding. The Research Officers concerned are simultaneously investigating the associated effects of anaemia caused chiefly by the prevalent hook-worm infestation, and the precise form of the supplementary diet required. Formulation of future policy must await the results of these important inquiries.

Appendix C described the current outlook on malarial prophylaxis in children, but since it was written certain shortcomings of paludrine have been recognised, necessitating further review and consequent delay in implementing the proposed programme.

(*d*) Labour and Housing Conditions. With the appointment of a Labour Officer, an annual report is now published by his Department. There have been no important changes in the housing situation, but the Department has prepared a review of Protectorate conditions which is now under consideration

(*e*) Food in relation to Health and Disease. There are no unusual features to report.

(*f*) Port Health Work and Administration.
Number of ships boarded.
Number of Aircraft in transit.
No unusal features to report.

(*g*) Maternal and Child Welfare. Clinics remained in popular operation, but again it was found possible to extend the service to additional areas.

CENTRE.	ANTE-NATAL CLINICS. New cases.	ANTE-NATAL CLINICS. Attendances.	INFANT WELFARE. New cases.	INFANT WELFARE. Attendances.
(i) Bathurst and vicinity:—				
Anglesea Street	171	897	212	2,861
New Street	305	1,414	334	4,208
Bakau	157	705	124	1,728
Brikama	111	302	560	3,126
Sukuta	221	826	408	3,210
(ii) Georgetown	126	303	84	208
(iii) Basse	102	267	209	878
Totals ...	1,193	4,714	1,931	16,219

Confinements attended on district by Government midwives:—

CENTRE.	Deliveries.	Live births.	Still births.
(i) Bathurst	195	193	2
(ii) Bakau	81	76	5
(iii) Brikama	2	2	—
(iv) Sukuta	120	117	3
(v) Georgetown ...	44	38	2
(vi) Basse	34	28	2
Totals	476	454	12

The Health Sister, assisted by three Temporary Health Visitors, visited Bathurst homes as follows:—

First visits.	Effectual visits.	Ineffectual visits.	Total.
502	5,268	2,053	7,813

Towards the end of the year the team also commenced "cleanliness" inspections of schools and scholars in eight primary schools in Bathurst, and similar grades of school at Bakau, Sukuta and Brikama. Instituted with the co-operation of the Education Department, chiefly because of temporary suspension of school inspections by the Medical Officer of Health, these inspections have proved of definite value, and have been welcomed by teachers. As might be anticipated the response varied a good deal, but should give more consistent results as the system continues. The most noticeable criticism concerned dental hygiene, and commencing in 1949, the Government Dentist will undertake periodical inspection and treatment.

Over 12,000 free milk issues were made to needy mothers and children at the various clinics, and during the severe rains and floods in Bathurst, hot milk drinks were distributed to the children in the areas most affected.

Maternity Hospital, Bathurst.

(Total Hospital statistics are included in Appendix A)

Total admissions	315	359	346
Confinements	172	234	203
Ante and post natal affections ...	30	120	108
Abortions	11	19	26

C. W. F. MACKAY,
Director of Medical Services.

APPENDIX A.

WORK OF LABORATORY SERVICE.

(i) Parasitology.

Plasmodia, trypanosomes and filaria were the commonest findings in that order in 4,621 blood films, and evidence of ankylostomes, ascaries, trichuris, taenia, oxyuris, strongyloides, flagellates, and entamoeba histolytica were observed in many of the 3,078 faeces examined. Schistosomes were seen in 27 of 85 African urines and of 483 African placental smears, 68 contained malarial parasites.

(ii) Serology. Of 2,245 sera submitted to the kahn test, 584 were from ante and post-natal cases. Of the total examined 637 were classified as positive, 59 " doubtful ", and 1,549 negative.

(iii) General. The following summary, inclusive of the foregoing groups, indicates the volume of examinations undertaken :—

Parasitology	8,286
Serology	2,253
Bacteriology	1,660
Miscellaneous	1,356
Autopsies	23
Total	13,578

The causes of death revealed at autopsy included multiple injuries 3, malaria 2, gun shot wound 1, lobar pneumonia 1, broncho-pneumonia 1, bronchitis 1, cerebro-spinal meningitis 2, acute pericarditis 1, myocardial degeneration 1, ventricle rupture 1, aortic rupture 1, cerebral haemorrhage 1.

The first recorded case of visceral leishmaniasis occurred during the year in a South Kombo areas. After diagnosis locally by Dr. Walters of the Medical Research Council, Fajara, it was confirmed by Professor Shortt of the London School of Tropical Medicine.

APPENDIX B.

MALARIA PROPHYLAXIS IN BATHURST.

The original view of the Medical Department was that it would be desirable, if not actually necessary, to institute large scale anti-malaria chemoprophylaxis measures in Bathurst, particularly for the sake of the younger age groups, including school children. While arrangements to this end were under consideration, it became apparent that the consensus of local medical opinion was sharply divided in this matter, and in consequence a conference of doctors was held to thresh out the problem. Six doctors, including two from the Medical Research Council Nutrition Unit, and the Entomologist, took part in the discussions.

2. The conference reached general agreement on several points, viz.,

Vectors.

(i) Bathurst and vicinity was in a peculiar transition stage in relation to mosquito vectors. From the pre-1934 days of negligible control, the picture was now one of increasing control, markedly accelerated in the last few years, with a prospect of virtual elimination in the comparatively near future if the major swamp reclamation measures now proposed are adopted.

(ii) Meantime the situation is that routine control in Bathurst in relation to anophelines and Aedes is almost at maximum efficiency level, but that invasion by anophelines from adjacent swamps is continuous, ranging from a low to moderate density for most of the year to the explosive phase of high density noted at the beginning of the rains. Until the swamp breeding foci are dealt with therefore the areas infested must be regarded as remaining an endemic area, and indeed a potentially hyperendemic area to certain groups of the population in the season of high anopheline density. This unsatisfactory position cannot be improved until the swamp foci can be dealt with, and at present this can only be accomplished by major reclamation measures.

Human hosts.

(iii) Of the two main divisions concerned (tolerant Africans and intolerant Europeans) the present interest is with the African.

(iv) The evidence for withholding chemoprophylaxis from Africans is in accord with the opinion of Dr. Barbour the Rockefeller Foundation expert who has stated that the African bears his parasites well, indeed many observers have commented on the absence of clinical signs and symptoms in children harbouring heavy parasitic infestation. Dr. Barbour sums up in the following quotation taken from Sierra Leone Medical Department Paper No. 1/1946 entitled "Report on Malaria in Freetown and District":—

> "The natural history of untreated hyperendemic malaria is an African community is briefly as follows:—
> Age 0—1 years:—Primary infection which may or may not be serious (average malaria death rate 3.0 per cent) depending on the strain or the presence of natural or passive immunity. The parasite rate and the degree of infestation rise steadily throughout this period.
> Age 1—3 years: The parasite rate and the degree of infestation reach a maximum. Clinical effects may be marked but risk of death is small.

Age 3—12 :—The parasite rate remain moderately high but tends to fall rapidly at the upper age-limit. The degree of infestation fluctuates widely but gradually decreases with the parasite rate. Clinical signs and symptoms vary but generally speaking the disease is not serious and recovery rapid.

Age 12 years and upwards.—Parasite rate fall to their minimum value and the degree of infestation is also low. Occasional mild attacks of fever are experienced. If people in this age group migrate to new areas they tend to react violently to the new strains of parasites encountered."

(v) The evidence for the undertaking of chemoprophylaxis in children is as follows. (There is general local agreement that African adults attain a degree of tolerance rending systematic chemoprophylaxis unneccessary).

" (*a*) *Freetown.* Mortality and Morbidity due to Malaria.

(A) Deaths due to Malaria (Most are uncertified).

	Under 1 year.	1—5 years.	6—10 years.	Over 10 years.	Total.
1943	22	24	25	16	89
1944	55	41	3	23	120

(B) Proportion of total deaths ascribed to malaria.

	1943.	1944.
Under 1 year ...	16 per-cent.	8 per cent
All ages ...	6.3 ,, ,,	5.4 ,, ,,

(C) Infant mortality rate by months.

	J	F	M	A	M	J	J	A	S	O	N	D.
Average 1936—1943	159	175	159	189	224	223	223	245	187	168	162	162
Average 1944	140	127	164	165	157	172	137	151	133	152	164	177
Percentage Decrease	−12	−27	+3	−13	−30	−23	−39	−38	−28	−9	+1	+9

The marked fall in the I.M.R. gives evidence of a fall in malarial incidence as the maximum reduction corresponds with the season of maximum malaria transmission."

The author of the Freetown Report (Dr. Turner now D.M.S. Gold Coast) comments also:—

"(our) tables indicate that mortality due to malaria has in the past "been high, and that as far as infants and young children are con-"cerned, malaria is one of the major causes of death. It is difficult "to reconcile those two findings (Dr. Barbour's opinion v. Freetown "findings) and many explanations are possible, e.g., (*a*) that children "born of mothers who have had heavy parasitic invasion during "pregnancy carry over some immunity long enough to gain a small "initial tolerance to the malaria parasite or that these children take "in with their mothers' milk such possible immunity or (*b*) that "there are wide natural variations and that the African has not yet as "a race developed the natural resistance to *falciparum* which he has to "benign tertian malaria or (*c*) that there are multiple strains of para-"sites and that some are much more toxic than others. On this "assumption a child would become seriously ill only if he acquired "a toxic strain before developing some group tolerance from other "strains".

(*b*) *Lagos and Accra.* The following quotation is a copy of paragraph 22 of the Gambia Annual Medical Report for 1944. (The late Dr. Smith was an internationally recognised expert in tropical pathology. Dr. Whitbourne's work is understood to relate to Accra and environs).

"Recent trends stress the value of suppressive drugs for the native "infant and young child while they are building up a natural racial "resistance. The susceptibility of this group may be guaged by "Smith's work in Lagos, published in Trans. R. Soc. Trop. Med. Hyg. "Vol. XXXVI No. 5. In a review of the result of 500 postmortems "in Lagos on children up to three years of age, he estimated 14.4% "of the deaths were due to malaria. The same article quoted Whit-"bourne, (working in a different endemic area), who estimated 8 to 10% "of infantile mortality was due to the same cause. There seems little "doubt therefore that in what otherwise might be regarded as an "immunological interference, the use of suppressive is well warranted "provided the suppressive policy is maintained up to school age when "extra-familial observation would come into operation".

(*c*) *Bathurst.* The evidence, for and against, has less verification. We know the infantile mortality rate remain high and the Medical Department presumes with confidence that a significant percentage is due to malaria. We know of the high parasite and splenic rates. Febrile illnesses associated with parasitaemia are commonplace, and although the contribution of the latter to the fever is often disputed, the exhibition of an anti-malaria drug very frequently coincides with recovery of the patient. There are insufficient postmortem statistics to weight the evidence. It is fully accepted that parasitaemia is not necessarily accompanied by pyrexia or other gross objective signs, but whether unrecognised minor subjective symptoms are present in another matter. Anæmia is not proved to be specifically due to malaria although like parasitæmia it occurs extremely frequently. It was agreed that higher morbidity is observed in the " sick season " i.e. the rainy season, but in some quarters this is attributed to climate and not to specific infestation. There is no doubt that a mutual tolerance has grown up between parasite and host but so it has also in the case of trypanosomes. It is to be inferred that while the tolerance is precarious and liable to break down in sleeping sickness, the malaria-man association is much more stable? Surely it may be argued that the aggregate of coincidence shown is too great to acquit the parasite of any wrong-doing?

Conclusions.

3. The conference was in general agreement that the outstanding remedy was intensification of mosquito control, even if this removed the Bathurst resident from the tolerant to the intolerant category each time he ventured out of the mosquito-control zone, and thus put himself on the level of the less tolerant European.

4. On the question of chemoprophylaxis there was agreement that while vectors remained in significant numbers—seasonally or otherwise—it would be too risky at present to attempt to sterilise any section of the tolerant community thus lying them open to severe reaction on fresh infection. In any case local conditions would render the institution of effective large-scale continued chemoprophylaxis an impracticable measure. It was therefore agreed that for the present the Departmental policy might be to encourage prophylaxis in the 0--1 year group through the medium of hospitals and clinics. At later ages and particularly in Schools the appearance of clinical symptoms could be met with the restricted exhibition of anti-malarial drugs sufficient only to lower the symptoms to a sub-clinical level without any attempt at sterilisation. It was anticipated that one or two tablets of Paludrine in single divided does of 0.1 gm. should be enough to abate symptoms without upsetting natural or acquired resistance.

5. It was agreed that all anti-malarial drugs had short-comings but that Paludrine had certain advantages e.g. effectiveness at sporozoite stage and less toxicity than mepacrine. Quinine was too expensive for general exhibition.

APPENDIX C.

Local list No.	No. in International List (1938)		Europeans.			Africans				Total of all cases.
			Inpatients	I.P. Deaths	Out-patients	Inpatients	I.P. Deaths	Out-patients	Dis-pensaries.	
		GROUP I.								
1	1	Typhoid fever	—	—	—	1	1	—	—	1
2	2	Paratyphoid fevers	—	—	—	—	—	—	—	—
3	3	Plague	—	—	—	—	—	—	—	—
4	4	Cholera	—	—	—	—	—	—	—	—
5	6	Cerebro Spinal meningitis	—	—	—	20	8	23	4	47
6	9	Whooping cough	—	—	2	8	—	197	—	207
7	10	Diphtheria	1	—	—	2	2	1	—	4
8	12	Tetanus (not neonatorum)	—	—	—	14	7	22	8	44
9	13	Tuberculosis of the Respiratory System	—	—	—	42	20	114	90	246
10	14—22	Other forms of Tuberculosis	—	—	—	12	1	12	—	24
11	23	Leprosy	—	—	—	2	—	44	187	233
12	27	Dysentery (*a*) Bacillary	1	—	10	9	—	10	—	30
		(*b*) Amoebic	—	—	—	3	—	7	—	10
		(*c*) Other or unspecified forms	—	—	3	15	—	269	147	434
13	28	Malaria (*a*) Benign tertian	—	—	—	—	—	—	—	—
		(*b*) Quartan	—	—	—	—	—	—	—	—
		(*c*) Subtertian	18	—	77	421	5	853	—	1,369
		(*d*) Unspecified	6	—	197	160	7	4,494	4,157	9,014
		(*e*) Blackwater fever ...	—	—	—	1	1	—	—	1
14	29	Trypanosomiasis	—	—	—	44	8	332	1,192	1,568
15		Venereal Diseases—								
	30	(*a*) Syphilis including locomotor ataxia & G.P. I	1	—	4	90	5	445	295	835
	25	(*b*) Gonorrhoea and gonoccocal infections	—	—	9	122	1	894	1,284	2,309
	44a	(*c*) Other venereal diseases	1	—	2	63	—	176	—	242
16	32a	Relapsing fever	—	—	—	—	—	—	—	—
17	31	Yaws	—	—	40	42	2	1,430	3,638	5,150
18	38a	Influenza	3	—	19	46	—	564	55	687
19	34	Smallpox	—	—	—	17	—	5	2	24
20	38b	Measles	—	—	—	—	—	2	—	2
21	38e	Varicell	1	—	—	5	—	3	7	16
		Carried forward ...	32	—	363	1,139	68	9,897	11,066	22,497

APPENDIX C.—*Contd*

Local list No.	No. in International List (1938)		Europeans.			Africans				Total of all cases.
			Inpatients	I.P. Deaths	Out-patients	Inpatients	I.P. Death	Out-patients	Dis-pensaries.	
		Brought forward ...	32	—	363	1,139	68	9,897	11,066	22,497
22	35	Rabies	—	—	—	—	—	—	—	—
23	33	Yellow fever	—	—	—	—	—	—	—	—
24	39	Typhus	1	—	—	—	—	—	—	1
25	40	Ankylostomiasis	—	—	3	82	—	92	146	323
26	42	Ascariasis	1	—	19	150	4	1,370	2,171	3,711
27	42	Schistosomiasis	—	—	6	5	1	132	121	264
28	42	Filariasis	—	—	6	5	1	99	—	110
29	42	Tapeworm	—	—	—	7	—	107	101	215
30	42	Other helminthic diseases	—	—	—	11	1	1,310	5	1,326
31	43	Mycoses:								
		(*a*) Tinea and ringworm	—	—	7	4	—	160	—	171
		(*b*) Other mycoses	—	—	—	—	—	—	—	—
32	(5, 7, 8,) (11, 24,) (26, 29b,) (32b &) (c, 36,) (37, 38c,) (41, 44b,) (c d.)	Other infective and parasitic diseases ...	—	—	1	12	5	24	—	37
		GROUP II.								
		Cancers and other Tumours—								
33	45—55	(*a*) Malignant	—	—	—	33	10	28	—	61
34	56	(*b*) Non-malignant	—	—	6	17	—	43	—	66
35	57	(*c*) Unspecified	—	—	2	15	—	11	89	117
		GROUP III.								
36	58—60	Rheumatic conditions	—	—	43	47	2	1,633	5,029	6,752
37	61	Diabetes mellitus	—	—	—	—	—	—	—	—
38	63	Goitre	—	—	13	2	—	179	—	194
39	66	Other general diseases	—	—	1	—	—	2	—	3
		Vitamin deficiency diseases								
40	71	Hypovitaminosis A	—	—	—	—	—	—	—	—
41	68	do. B1	—	—	—	3	—	4	—	7
42	69—71	do. B	—	—	—	1	—	1	—	2
43	67	do. C	—	—	—	1	—	2	—	3
		Carried forward ...	34	—	470	1,534	92	15,094	18,728	35,860

APPENDIX C.—*Contd.*

Local list No.	No. in International List (1938)		Europeans.			Africans				Total of all cases.
			Inpatients	I.P. Deaths	Out-patients	Inpatients	I.P. Deaths	Out-patients	Dis-pensaries.	
		Brought forward ...	34	—	470	1,534	92	15,094	18,728	35,860
44	70	Rickets	—	—	—	6	2	—	—	6
45	71	Other or unspecified deficiency diseases	1	—	6	13	3	59	—	79
		GROUP IV.								
46	73	Anaemias (*a*) Pernicious	—	—	—	—	—	—	—	—
		(*b*) Other	1	—	8	48	—	291	—	348
47	75	Splenomegaly	—	—	—	27	1	140	—	167
48	72, 74, 76	Other diseases of the blood and blood forming organs	—	—	—	6	2	5	—	11
		GROUP V.								
		Acute and chronic poisoning— ...								
49	77	(*a*) Alcoholism	—	—	—	2	—	—	—	2
50	78, 79	(*b*) Others	—	—	—	—	–	—	—	—
		GROUP VI.								
51	84	Mental diseases	1	—	3	10	1	2	—	16
52	88	Trachoma	—	—	2	8	—	31	—	41
53	88	Other eye diseases	4	—	42	66	—	1,232	1,935	3,279
54	89	Diseases of the ear and mastoid sinus ...	4	—	50	19	—	472	688	1,233
55	80, 82, 83, 85—87	Other diseases of the nervous system and sense organs	1	—	6	40	10	185	14	246
		GROUP VII.								
56	90—95	Heart diseases	–	—	7	82	35	124	—	213
57	96—103	Other diseases of the circulatory system	1	—	16	59	1	238	138	452
58	106	Bronchitis	3	—	53	166	4	3,192	5,412	8,826
59	107	Pneumonia (*a*) Broncho-pneumonia ...	—	—	—	55	22	64	—	119
60	108	(*b*) Lobar-pneumonia ..	—	—	2	105	15	17	—	124
61	109	(*c*) Unspecified ...	—	—	4	21	4	58	134	217
		Carried forward ..	50	—	669	2,267	192	21,204	27,049	51,239

APPENDIX C.—*Contd.*

Local list No.	No. in International List (1938		Europeans.			Africans				Total of all cases.
			Inpatients	I.P. Deaths	Out-patients	Inpatients	I.P. Deaths	Out-patients	Dis-pensaries.	
		Brought forward ...	50	—	669	2,267	192	21,204	27,049	51,239
62	104, 105, 110—114	Other respiratory diseases (excluding tuberculosis)	1	—	21	76	1	867	168	1,133
		GROUP IX.								
63	117	Ulcers of stomach and duodenum ...	—	—	6	3	1	41	—	50
		Diarrhoea and Enteritis:								
64	119	(*a*) Under 2 years	—	—	4	17	1	339	920	1,280
65	120	(*b*) 2 years and over	1	—	12	44	7	1,259	795	2,111
66	121	Appendicitis	2	—	1	10	—	16	—	29
67	122	Hernia and Intestinal obstruction ...	1	1	13	276	10	474	122	886
68	124	Cirrhosis of the liver	—	—	—	26	7	21	—	47
69	125—126	Other diseases of the liver and biliary passages	3	—	5	38	5	58	108	212
70	115,—16, 118, 123, 127—129	Other diseases of the digestive system	2	—	97	138	11	4,769	8,959	13,965
		GROUP X.								
71	130—132	Nephritis	—	—	—	26	4	69	—	95
72	133—139	Other non-venereal diseases of the genito-urinary system	3	—	14	399	7	1,358	180	1,954
		GROUP XI.								
73	150	Deliveries	3	—	1	213	—	61	—	278
74	140—2	Abortions	3	—	2	45	—	98	127	275
75	143	Haemorrhage of pregnancy	—	—	—	18	1	16	—	34
76	144 & 148	Toxaemias of pregnancy and puerperium	—	—	—	21	—	—	—	21
77	147	Infection during childbirth and puerperium	—	—	—	—	—	1	—	1
78	145, 6 & 9	Other conditions of pregnancy and puerperium	—	—	—	42	4	1	140	183
		GROUP XII.								
79	153	Ulcers	—	—	10	54	1	1,134	2,345	3,543
80	153	Elephantiasis	—	—	—	24	—	89	52	165
81	151—153	Other diseases of the skin and cellular tissues	8	—	111	283	8	2,531	2,171	5,104
		Carried forward ...	77	1	966	4,020	260	34,406	43,136	82,605